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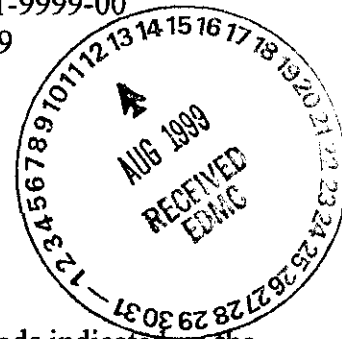
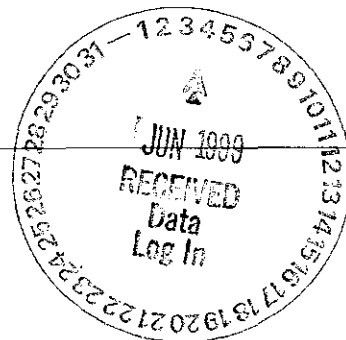
Virtual Laboratories Everywhere

0051534

**Recra LabNet Philadelphia
Analytical Report**

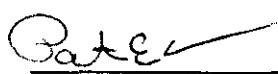
Client : TNU-HANFORD B99-002
RFW# : 9904L629
SDG# : H0377
SAF# : B99-002

W.O. # : 10985-001-001-9999-00
Date Received: 04-07-99



INORGANIC CASE NARRATIVE

1. This narrative covers the analyses of 4 soil samples.
2. The samples were prepared and analyzed in accordance with the methods indicated on the attached glossary.
3. Sample holding times as required by the method and/or contract were met.
4. The cooler temperature was recorded on the chain-of-custody.
5. The method blank for Chromium VI was within method criteria.
6. The Laboratory Control Samples (LCS) for Chromium VI were within the laboratory control limits.
7. The matrix spike recoveries for Chromium VI were within the 75-125% control limits.
8. The replicate analysis for Chromium VI was within the 20% Relative Percent Difference (RPD) control limit.
9. Results for solid samples are reported on a dry weight basis.



J. Michael Taylor
Vice President
Philadelphia Analytical Laboratory

5-21-99
Date

pefi04-629

The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 10 pages.

001

WET CHEMISTRY

METHODS GLOSSARY FOR ANALYSIS OF SOIL/SOLID SAMPLES

	<u>ASTM</u>	<u>SW846</u>	<u>OTHER</u>
%Ash	__ D2216-80		
%Moisture	__ D2216-80		__ ILMO4.0 (e)
%Solids			✓ ILMO4.0 (e)
%Volatile Solids	__ D2216-80		
ASTM Extraction in Water	__ D3987-81/85		
BTU	__ D240-87		
CEC		__ 9081	__ c
Corrosivity __ by coupon __ by pH		__ 1110 (mod) __ 9045	
Cyanide, Total		__ 9010	__ ILMO4.0 (e)
Cyanide, Reactive		__ Sec 7.3	
Density			__ b
Halides, Extractable Organic			__ EPA 600/4/84-008 (mod)
Halides, Total			__ EPA 600/4/84-008 (mod)
EP-Toxicity		__ 1310A	
Flash Point		__ 1010	
Ignitability		__ 1010	
Carbon, Total Organic (by LOI)			__ c
Oil and Grease		__ 9071A	
Carbon, Total Organic		__ 9060	__ Lloyd Kahn (mod)
Oxygen Bomb Prep for Anions	__ D240-87 (mod)	__ 5050	
Petroleum Hydrocarbons, Total Recoverable		__ 9071	__ EPA 418.1 (mod)
pH, Soil		__ 9045B	
Sulfide, Reactive		__ Sec 7.3	
Specific Gravity	__ D1429-76C		
Sulfur, Total		__ 9056	
TCLP		__ 1311	
TCLV		__ 1311	
Synthetic Precipitation Leach		__ 1312	
Chlorine, Total		__ 9056	
Paint Filter		__ 9095	

Other: Chromium VI

Method: SW 3060A/7196A

METHOD REFERENCES AND DATA QUALIFIERS

DATA QUALIFIERS

U = Indicates that the parameter was not detected at or above the reported limit. The associated numerical value is the sample detection limit.

* = Indicates that the original sample result is greater than 4x the spike amount added.

ABBREVIATIONS

MB = Method or Preparation Blank.

MS = Matrix Spike.

MSD = Matrix Spike Duplicate.

REP = Sample Replicate

LC = Laboratory Control Sample.

NC = Not calculated.

A suffix of -R, -S, or -T following these codes indicate a replicate, spike or sample duplicate analysis respectively.

ANALYTICAL WET CHEMISTRY METHODS

1. ASTM Standard Methods.
2. USEPA Methods for Chemical Analysis of Water and Wastes (USEPA 600/4-79-020).
3. Test Methods for Evaluating Solid Waste (USEPA SW-846).
 - a. Standard Methods for the Examination of Water and Waste, 16 ed., (1989).
 - b. Standard Methods for the Examination of Water and Waste, 17 ed., (1983)
 - c. Method of Soil Analysis, Part 1, Physical and Mineralogical Methods, 2nd. Ed. (1986)
 - d. Method of Soil Analysis, Part 2, Chemical and Microbiological Properties, Am. Soc. Agron., Madison, WI (1965)
 - e. USEPA Contract Laboratory Program, Statement of Work for Inorganic Analysis.
 - f. Code of Federal Regulations.

RFW 21-21L-034/D-06/96

Recra LabNet - Lionville

INORGANICS DATA SUMMARY REPORT 04/13/99

CLIENT: TNU-HANFORD B99-002

RECRA LOT #: 9904L629

WORK ORDER: 10985-001-001-9999-00

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-----	-----	-----	-----	-----	-----	-----
-001	BOV1W7	% Solids	96.3	%	0.01	1.0
		Chromium VI	0.86	MG/KG	0.42	1.0
-002	BOV1W8	% Solids	94.4	%	0.01	1.0
		Chromium VI	0.86	MG/KG	0.42	1.0
-003	BOV1W9	% Solids	95.5	%	0.01	1.0
		Chromium VI	0.42 u	MG/KG	0.42	1.0
-004	BOV1X0	% Solids	91.5	%	0.01	1.0
		Chromium VI	0.44 u	MG/KG	0.44	1.0

Recra LabNet - Lionville

INORGANICS METHOD BLANK DATA SUMMARY PAGE 04/13/99

CLIENT: TNU-HANFORD B99-002

RECRA LOT #: 9904L629

WORK ORDER: 10985-001-001-9999-00

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
BLANK10	99LVI033-MB1	Chromium VI	0.40 u	MG/KG	0.40	1.0

Recra LabNet - Lionville

INORGANICS ACCURACY REPORT 04/13/99

CLIENT: TNU-HANFORD B99-002

RECRA LOT #: 9904L629

WORK ORDER: 10985-001-001-9999-00

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR (SPK)
-004	BOV1X0	Soluble Chromium VI	4.4	0.2 ^{0.44u} 0.44u	4.4	108.0	1.0
		Insoluble Chromium VI	1180	0.3 ^{0.44u} 0.44u	1300	90.3	20.0
BLANK10	99LVI033-MB1	Soluble Chromium VI	3.9	0.40u	4.0	97.3	1.0
		Insoluble Chromium VI	1040	0.40u	1160	89.1	20.0

Recra LabNet - Lionville

INORGANICS PRECISION REPORT 04/13/99

CLIENT: TNU-HANFORD B99-002

RECRA LOT #: 9904L629

WORK ORDER: 10985-001-001-9999-00

SAMPLE	SITE ID	ANALYTE	INITIAL RESULT	REPLICATE RPD	DILUTION FACTOR (REP)
-----	-----	-----	-----	-----	-----
-004REP	BOV1X0	† Solids	91.5	91.3 0.23	1.0

Recra LabNet - Lionville Laboratory
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNU-HANFORD B99-002

DATE RECEIVED: 04/07/99

RFW LOT # :9904L629

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
BOV1W7						
% SOLIDS	001	S	99L%S051	04/01/99	04/09/99	04/12/99
CHROMIUM VI	001	S	99LVI033	04/01/99	04/12/99	04/12/99
BOV1W8						
% SOLIDS	002	S	99L%S051	04/01/99	04/09/99	04/12/99
CHROMIUM VI	002	S	99LVI033	04/01/99	04/12/99	04/12/99
BOV1W9						
% SOLIDS	003	S	99L%S051	04/01/99	04/09/99	04/12/99
CHROMIUM VI	003	S	99LVI033	04/01/99	04/12/99	04/12/99
BOV1X0						
% SOLIDS	004	S	99L%S051	04/01/99	04/09/99	04/12/99
% SOLIDS	004 REP	S	99L%S051	04/01/99	04/09/99	04/12/99
CHROMIUM VI	004	S	99LVI033	04/01/99	04/12/99	04/12/99
CHROMIUM VI	004 MS	S	99LVI033	04/01/99	04/12/99	04/12/99
CHROMIUM VI	004 MSD	S	99LVI033	04/01/99	04/12/99	04/12/99

LAB QC:

CHROMIUM VI	MB1	S	99LVI033	N/A	04/12/99	04/12/99
CHROMIUM VI	MB1 BS	S	99LVI033	N/A	04/12/99	04/12/99
CHROMIUM VI	MB1 BSD	S	99LVI033	N/A	04/12/99	04/12/99

600

[illegible]

Bechtel Hanford Inc.		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST					B99-002-79		Page 1 of 1		
Collector Fahlberg/Coffman		Company Contact R Coffman		Telephone No. 373-6425		Project Coordinator TRENT, SJ		Price Code		Data Turnaround 15 Days	
Project Designation 100 BC Areas - Full Protocol		Sampling Location 100 B/C 116-B-12 deep zone		SAF No. B99-002							
Ice Chest No. 844		Field Logbook No. EL 1327-2		Method of Shipment Fed Ex							
Shipped To TMA/RECRA R.F. 4-1-99		Offsite Property No. A990098		Bill of Lading/Air Bill No. 423579524375							
9904L629				COA							

POSSIBLE SAMPLE HAZARDS/REMARKS	Preservation	None	None	Cool 4C	None	None					
	Type of Container	aG	aG	aG	aG	aG					
	No. of Container(s)	1	1	1	1	1					
	Special Handling and/or Storage	Volume	60mL	60mL	125mL	250mL	1000mL				

SAMPLE ANALYSIS				Activity Scan	See item (1) in Special Instructions.	Chromium Hex - 7196	ICP Metals - 6010A (SW-846) (Chromium, Lead); Mercury - 7471 - (CV)	See item (2) in Special Instructions.			
-----------------	--	--	--	---------------	---------------------------------------	---------------------	---------------------------------------------------------------------	---------------------------------------	--	--	--

Sample No.	Matrix *	Sample Date	Sample Time							
B0V1W7	Soil	4-1-99	0845			X	X			tie to BOTV Y9
B0V1W8	Soil	4-1-99	0920			X	X			BOTW 00
B0V1W9	Soil	4-1-99	0920			X	X			BOTW 01
B0V1X0	Soil	4-1-99	0945			X	X			BOTW 01

CHAIN OF POSSESSION	Sign/Print Names		SPECIAL INSTRUCTIONS	Matrix *
Relinquished By <i>R. Coffman</i>	Date/Time 4-1-99 1600	Received By <i>IC</i>	Date/Time 4-1-99 1600	Soil Water Vapor Other Solid Other Liquid
Relinquished By <i>IC</i>	Date/Time 4/6/99 1100	Received By <i>R. Nielsen</i>	Date/Time 4/6/99 1100	
Relinquished By <i>R. Nielsen</i>	Date/Time 4/6/99 1300	Received By <i>Fed Ex</i>	Date/Time	
Relinquished By <i>Rede</i>	Date/Time	Received By <i>Truder</i>	Date/Time 4/7/99 0930	

LABORATORY SECTION	Received By	Title	Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method		Disposed By

9904L629 4.20C

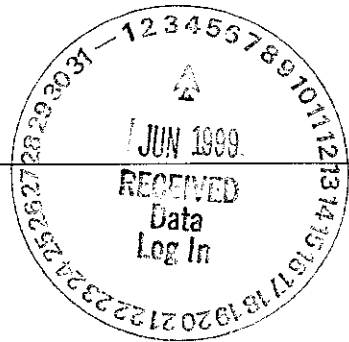
R.T. Coffman unavailable to relinquish samples



**RECRA
LabNet**

a division of Recra Environmental, Inc.

Virtual Laboratories Everywhere



**Recra LabNet Philadelphia
Analytical Report**

Client : TNU-HANFORD B99-002
RFW# : 9904L629
SDG/SAF# : H0377/B99-002

W.O.# : 10985-001-001-0001-00
Date Received: 04-07-99

METALS CASE NARRATIVE

1. This narrative covers the analyses of 4 soil samples.
2. The samples were prepared and analyzed in accordance with methods checked on the attached glossary. Two fold dilutions were performed on the the ICP metals due to the sample matrix.
3. All analyses were performed within the required holding times.
4. The cooler temperature has been recorded on the Chain of Custody.
5. All Initial and Continuing Calibration Verifications (ICV/CCVs) were within the 90-110% control limits.
6. All Initial and Continuing Calibration Blanks (ICB/CCBs) were within control limits (less than the PQL).
7. All preparation/method blanks (MB) were within method criteria {less than the Practical Quantitation Limit (3X the IDL) or samples greater than 20X MB value}. Refer to the Inorganics Method Blank Data Summary.
8. All ICP Interference Check Standards were within control limits.
9. All laboratory control samples (LCS) were within the laboratory control limits. Refer to the Inorganics Laboratory Control Standards Report.
10. All matrix spike (MS) recoveries were within the 75-125% control limits. Refer to the Inorganics Accuracy Report.
11. All duplicate analyses were within the 20% Relative Percent Difference (RPD) control limits. Refer to the Inorganics Precision Report.

The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 13 pages.

12. For the purposes of this report, the data has been reported to the Instrument Detection Limit (IDL). Values between the IDL and the Practical Quantitation Limit (PQL) are acquired in a region of less-certain quantification.



J. Michael Taylor
Vice President
Philadelphia Analytical Laboratory

mld/m04-629

4-29-99

Date



METALS METHOD GLOSSARY

The following methods are used as reference for the digestion and analysis of samples contained within this

Recra Lot#: 9904L629

Leaching Procedure: 1310 1311 1312 Other: _____

CLP Metals Digestion and Analysis Methods: ILM03.0 ILM04.0

Metals Digestion Methods: 3005A 3010A 3015 3020A 3050A 3051 200.7 SS17
 Other: _____

Metals Analysis Methods

	SW846	EPA	STD MTD	EPA OSWR	USATHAMA
Aluminum	<u> </u> 6010B	<u> </u> 200.7			<u> </u> 99
Antimony	<u> </u> 6010B <u> </u> 7041 ⁵	<u> </u> 200.7 <u> </u> 204.2			<u> </u> 99
Arsenic	<u> </u> 6010B <u> </u> 7060A ⁵	<u> </u> 200.7 <u> </u> 206.2	<u> </u> 3113B		<u> </u> 99
Barium	<u> </u> 6010B	<u> </u> 200.7			<u> </u> 99
Beryllium	<u> </u> 6010B	<u> </u> 200.7			<u> </u> 99
Bismuth	<u> </u> 6010B ¹	<u> </u> 200.7 ¹		<u> </u> 1620	<u> </u> 99
Boron	<u> </u> 6010B	<u> </u> 200.7			<u> </u> 99
Cadmium	<u> </u> 6010B <u> </u> 7131A ⁵	<u> </u> 200.7 <u> </u> 213.2			<u> </u> 99
Calcium	<u> </u> 6010B	<u> </u> 200.7			<u> </u> 99
Chromium	<u> </u> 6010B <u> </u> 7191 ⁵	<u> </u> 200.7 <u> </u> 218.2			<u> </u> SS17
Cobalt	<u> </u> 6010B	<u> </u> 200.7			<u> </u> 99
Copper	<u> </u> 6010B <u> </u> 7211 ⁵	<u> </u> 200.7 <u> </u> 220.2			<u> </u> 99
Iron	<u> </u> 6010B	<u> </u> 200.7			<u> </u> 99
Lead	<u> </u> 6010B <u> </u> 7421 ⁵	<u> </u> 200.7 <u> </u> 239.2	<u> </u> 3113B		<u> </u> 99
Lithium	<u> </u> 6010B <u> </u> 7430 ⁴	<u> </u> 200.7		<u> </u> 1620	<u> </u> 99
Magnesium	<u> </u> 6010B	<u> </u> 200.7			<u> </u> 99
Manganese	<u> </u> 6010B	<u> </u> 200.7			<u> </u> 99
Mercury	<u> </u> 7470A ³ <u> </u> 7471A ³	<u> </u> 245.1 ² <u> </u> 245.5 ²			<u> </u> 99
Molybdenum	<u> </u> 6010B	<u> </u> 200.7			<u> </u> 99
Nickel	<u> </u> 6010B	<u> </u> 200.7			<u> </u> 99
Potassium	<u> </u> 6010B <u> </u> 7610 ⁴	<u> </u> 200.7 <u> </u> 258.1 ⁴			<u> </u> 99
Rare Earths	<u> </u> 6010B ¹	<u> </u> 200.7 ¹		<u> </u> 1620	<u> </u> 99
Selenium	<u> </u> 6010B <u> </u> 7740 ⁵	<u> </u> 200.7 <u> </u> 270.2	<u> </u> 3113B		<u> </u> 99
Silicon	<u> </u> 6010B ¹	<u> </u> 200.7		<u> </u> 1620	<u> </u> 99
Silica	<u> </u> 6010B	<u> </u> 200.7		<u> </u> 1620	<u> </u> 99
Silver	<u> </u> 6010B <u> </u> 7761 ⁵	<u> </u> 200.7 <u> </u> 272.2			<u> </u> 99
Sodium	<u> </u> 6010B <u> </u> 7770 ⁴	<u> </u> 200.7 <u> </u> 273.1 ⁴			<u> </u> 99
Strontium	<u> </u> 6010B	<u> </u> 200.7			<u> </u> 99
Thallium	<u> </u> 6010B <u> </u> 7841 ⁵	<u> </u> 200.7 <u> </u> 279.2 <u> </u> 200.9			<u> </u> 99
Tin	<u> </u> 6010B	<u> </u> 200.7			<u> </u> 99
Titanium	<u> </u> 6010B	<u> </u> 200.7			<u> </u> 99
Uranium	<u> </u> 6010B ¹	<u> </u> 200.7 ¹		<u> </u> 1620	<u> </u> 99
Vanadium	<u> </u> 6010B	<u> </u> 200.7			<u> </u> 99
Zinc	<u> </u> 6010B	<u> </u> 200.7			<u> </u> 99
Zirconium	<u> </u> 6010B ¹	<u> </u> 200.7 ¹		<u> </u> 1620	<u> </u> 99

Other: _____

Method: _____

METHOD REFERENCES AND DATA QUALIFIERS

DATA QUALIFIERS

U = Indicates that the parameter was not detected at or above the reported limit. The associated numerical value is the sample detection limit.

* = Indicates that the original sample result is greater than 4x the spike amount added.

ABBREVIATIONS

MB = Method or Preparation Blank.

MS = Matrix Spike.

MSD = Matrix Spike Duplicate.

REP = Sample Replicate

LCS = Laboratory Control Sample.

NC = Not calculated.

ANALYTICAL METAL METHODS

1. Not included in the method element list.
2. Modified Hg: Hg1 and Hg2 require less total volume of digestate due to the autosampler analysis. Sample volumes and reagents for mercury determinations in water and soil have been proportionately scaled down to adapt to this semi-automated technique. The sample volume used for water analysis is 33 mL. For soils, 0.1 grams of sample is taken to a final volume of 50 mL (including all reagents).
3. Modified Hg: Hg1 and Hg2 require less total volume of digestate due to the autosampler analysis. Sample volumes and reagents for mercury determinations in water and soil have been proportionately scaled down to adapt to this semi-automated technique. The sample volume used for water analysis is 33 mL. For soils, three 0.1 gram of sample is taken to a final volume of 50 mL (including all reagents).
4. Flame AA.
5. Graphite Furnace AA.

RFW 21-21L-033/N-10/96

Recra LabNet - Lionville

INORGANICS DATA SUMMARY REPORT 04/22/99

CLIENT: TNU-HAMFORD B99-002
WORK ORDER: 10985-001-001-9999-00

RECRA LOT #: 9904L629

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-001	BOV1W7	Chromium, Total	9.1	MG/KG	0.12	2.0
		Mercury, Total	0.02 u	MG/KG	0.02	1.0
		Lead, Total	5.7	MG/KG	0.37	2.0
-002	BOV1W8	Chromium, Total	8.2	MG/KG	0.13	2.0
		Mercury, Total	0.02 u	MG/KG	0.02	1.0
		Lead, Total	5.1	MG/KG	0.38	2.0
-003	BOV1W9	Chromium, Total	10.1	MG/KG	0.1	2.0
		Mercury, Total	0.02 u	MG/KG	0.02	1.0
		Lead, Total	5.2	MG/KG	0.29	2.0
-004	BOV1X0	Chromium, Total	10.8	MG/KG	0.11	2.0
		Mercury, Total	0.02 u	MG/KG	0.02	1.0
		Lead, Total	5.6	MG/KG	0.34	2.0

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INORGANICS METHOD BLANK DATA SUMMARY PAGE 04/22/99

CLIENT: TNU-HANFORD B99-002

RECRA LOT #: 9904L629

WORK ORDER: 10985-001-001-9999-00

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
*****	*****	*****	*****	*****	*****	*****
BLANK1	99L0222-MB1	Chromium, Total	0.18	MG/KG	0.06	1.0
		Lead, Total	0.18 u	MG/KG	0.18	1.0
BLANK1	99C0106-MB1	Mercury, Total	0.04	MG/KG	0.02	1.0

Recra LabNet - Lionville

INORGANICS ACCURACY REPORT 04/22/99

CLIENT: TNU-HANFORD B99-002

RECRA LOT #: 9904L629

WORK ORDER: 10985-001-001-9999-00

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR (SPK)
-----	-----	-----	-----	-----	-----	-----	-----
-001	BOV1W7	Chromium, Total	25.1	9.1	17.0	94.1	2.0
		Mercury, Total	0.19	0.02u	0.17	107.5	1.0
		Lead, Total	46.5	5.7	42.6	95.8	2.0

Recra LabNet - Lionville

INORGANICS PRECISION REPORT 04/22/99

CLIENT: TNU-HANFORD B99-002

RECRA LOT #: 9904L629

WORK ORDER: 10985-001-001-9999-00

SAMPLE	SITE ID	ANALYTE	INITIAL		DILUTION
			RESULT	REPLICATE RPD	
-----	-----	-----	-----	-----	-----
-001REP	BOVIW7	Chromium, Total	9.1	9.8 7.4	2.0
		Mercury, Total	0.02u	0.02u NC	1.0
		Lead, Total	5.7	5.9 3.4	2.0

INORGANICS LABORATORY CONTROL STANDARDS REPORT 04/22/99

CLIENT: TWU-HANFORD B99-002
 WORK ORDER: 10985-001-001-9999-00

RECRA LOT #: 99041629

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE AMOUNT	UNITS	%RECOV
LCS1	99L0222-LC1	Chromium, LCS	50.2	MG/KG	100.4
		Lead, LCS	247	MG/KG	98.6
LCS1	99C0106-LC1	Mercury, LCS	0.86	1.0 MG/KG	85.9

Recra LabNet - Lionville Laboratory
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNU-HANFORD B99-002

DATE RECEIVED: 04/07/99

RFW LOT # :9904L629

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
---------------------	-------	-----	--------	------------	-----------	----------

B0V1W7

CHROMIUM, TOTAL	001	S	99L0222	04/01/99	04/09/99	04/10/99
CHROMIUM, TOTAL	001 REP	S	99L0222	04/01/99	04/09/99	04/10/99
CHROMIUM, TOTAL	001 MS	S	99L0222	04/01/99	04/09/99	04/10/99
MERCURY, TOTAL	001	S	99C0106	04/01/99	04/14/99	04/15/99
MERCURY, TOTAL	001 REP	S	99C0106	04/01/99	04/14/99	04/15/99
MERCURY, TOTAL	001 MS	S	99C0106	04/01/99	04/14/99	04/15/99
LEAD, TOTAL	001	S	99L0222	04/01/99	04/09/99	04/10/99
LEAD, TOTAL	001 REP	S	99L0222	04/01/99	04/09/99	04/10/99
LEAD, TOTAL	001 MS	S	99L0222	04/01/99	04/09/99	04/10/99

B0V1W8

CHROMIUM, TOTAL	002	S	99L0222	04/01/99	04/09/99	04/10/99
MERCURY, TOTAL	002	S	99C0106	04/01/99	04/14/99	04/15/99
LEAD, TOTAL	002	S	99L0222	04/01/99	04/09/99	04/10/99

B0V1W9

CHROMIUM, TOTAL	003	S	99L0222	04/01/99	04/09/99	04/10/99
MERCURY, TOTAL	003	S	99C0106	04/01/99	04/14/99	04/15/99
LEAD, TOTAL	003	S	99L0222	04/01/99	04/09/99	04/10/99

B0V1X0

CHROMIUM, TOTAL	004	S	99L0222	04/01/99	04/09/99	04/10/99
MERCURY, TOTAL	004	S	99C0106	04/01/99	04/14/99	04/15/99
LEAD, TOTAL	004	S	99L0222	04/01/99	04/09/99	04/10/99

LAB QC:

CHROMIUM LABORATORY	LC1 BS	S	99L0222	N/A	04/09/99	04/09/99
CHROMIUM, TOTAL	MB1	S	99L0222	N/A	04/09/99	04/09/99
MERCURY LABORATORY	LC1 BS	S	99C0106	N/A	04/14/99	04/15/99
MERCURY, TOTAL	MB1	S	99C0106	N/A	04/14/99	04/15/99
LEAD LABORATORY	LC1 BS	S	99L0222	N/A	04/09/99	04/10/99

Recra LabNet - Lionville Laboratory
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNU-HANFORD B99-002

DATE RECEIVED: 04/07/99

RFW LOT # :9904L629

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
LEAD, TOTAL	MB1	S	99L0222	N/A	04/09/99	04/10/99

9904L629

Custody Transfer Record/Lab Work Request Page 1 of 1**FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS**[illegible]

Bechtel Hanford Inc.		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST					B99-002-79		Page 1 of 1		
Collector Fahlberg/Coffman		Company Contact R Coffman		Telephone No. 373-6425		Project Coordinator TRENT, SJ		Price Code		Data Turnaround 15 Days	
Project Designation 100 BC Areas - Full Protocol		Sampling Location 100 B/C 116-B-12 deep zone		SAF No. B99-002							
Ice Chest No. 844		Field Logbook No. EL 1327-2		Method of Shipment Fed Ex							
Shipped To FMA/RECRA R.F. 4-1-99		Offsite Property No. A990098		Bill of Lading/Air Bill No. 423579524375							
9904L629				COA							

POSSIBLE SAMPLE HAZARDS/REMARKS	Preservation	None	None	Cool 4C	None	None					
	Type of Container	aG	aG	aG	aG	aG					
	No. of Container(s)	1	1	1	1	1					
Special Handling and/or Storage	Volume	60mL	60mL	125mL	250mL	1000mL					

SAMPLE ANALYSIS				Activity Scan	See item (1) in Special Instructions.	Chromium Hex - 7196	ICP Metals - 6010A (SW-846) (Chromium, Lead); Mercury - 7471 - (CV)	See item (2) in Special Instructions.				
-----------------	--	--	--	---------------	---------------------------------------	---------------------	---------------------------------------------------------------------	---------------------------------------	--	--	--	--

Sample No.	Matrix *	Sample Date	Sample Time								
BOV1W7	Soil	4-1-99	0845			X	X				tie to BOTV Y9
BOV1W8	Soil	4-1-99	0920			X	X				BOTW 00
BOV1W9	Soil	4-1-99	0920			X	X				BOTW 00
BOV1X0	Soil	4-1-99	0945			X	X				BOTW 01

CHAIN OF POSSESSION	Sign/Print Names		SPECIAL INSTRUCTIONS				Matrix *	
Relinquished By <i>R. Coffman</i>	Date/Time 4-1-99 1600	Received By <i>Ref. IC</i>	Date/Time 4-1-99 1600	(1) Americium-241; Isotopic Plutonium; Isotopic Uranium; Strontium-89,90 - Total Sr; Nickel-63 (2) Gamma Spectroscopy (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155); Gamma Spec - Add-on (Americium-241, Uranium-238) R.T. Coffman unavailable to relinquish samples 9904L629 4.20c				Soil Water Vapor Other Solid Other Liquid
Relinquished By <i>Ref. IC</i>	Date/Time 4/6/99 1110	Received By <i>R. Nelson</i>	Date/Time 4/6/99 1110					
Relinquished By <i>R. Nelson</i>	Date/Time 4/6/99 1300	Received By <i>Fed Ex</i>	Date/Time					
Relinquished By <i>Fed Ex</i>	Date/Time	Received By <i>Nelson</i>	Date/Time 4/7/99 0930					

LABORATORY SECTION	Received By	Title	Date/Time
FINAL SAMPLE DISPOSITION	Disposed Method	Disposed By	Date/Time

Thermo Nutech

2030 Wright Avenue

P.O. Box 4040

Richmond, CA 94804-0040

(510) 235-2633 • FAX (510) 235-0438

May 4, 1999

Ms. Joan Kessner
3190 George Washington Way
Richland, WA 99352
MSIN: H9-03

Reference: P.O. #TRB-SBB-207925
Thermo Nutech N9-04-039-7111, SDG H0377



Dear Ms. Kessner:

Enclosed is the data report for four solid samples designated under SAF No. B99-002 received at Thermo Nutech on April 7, 1999. The samples were analyzed according to the accompanying chain-of-custody document.

Please call if you have any questions concerning this report.

Sincerely,

A handwritten signature in black ink, appearing to read "Terrie A. Higgins".

Terrie A. Higgins
Program Manager

TAH/kcj

Enclosure: Data Package

Case Narrative

1.0 GENERAL

Bechtel Hanford Inc. Sample Delivery Group H0377 is comprised of four solid (soil) samples designated under SAF No. B99-002 with a Project Designation of: 100 BC Areas-Full Protocol.

The samples were received as stated on the Chain-of-Custody documents. Any discrepancies are noted on the TNU Sample Receipt Checklist. Gamma Scan results were transmitted via fax on April 26, 1999; Isotopic Uranium and Nickel-63 were reported by fax on April 27, 1999; Total Strontium by fax on April 28, 1999; Isotopic Plutonium by fax on April 27 and May 4, 1999 and Americium by fax on April 28 and May 4, 1999.

2.0 ANALYSIS NOTES

2.1 Nickel-63 Analyses

No problems were encountered during the processing of the samples.

2.2 Total Strontium Analyses

No problems were encountered during the processing of the samples.

2.3 Isotopic Plutonium Analyses

No problems were encountered during the processing of the samples.

2.4 Gamma Scan Analyses

No problems were encountered during the processing of the samples.

2.5 Isotopic Uranium Analyses

No problems were encountered during the processing of the samples.

2.6 Americium-241 Analyses

No problems were encountered during the processing of the samples.


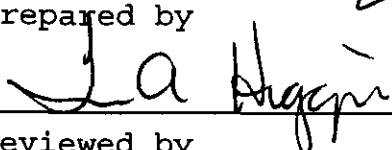
T M A / R I C H M O N D
SAMPLE DELIVERY GROUP H0377

SDG 7111
Contact L.A. Johnson

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0377

S U M M A R Y D A T A S E C T I O N

T A B L E O F C O N T E N T S				
About this section	.	.	.	1
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Prepared by

Reviewed by

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-TOC
Version 3.06
Report date 05/10/99

TMA / RICHMOND
SAMPLE DELIVERY GROUP H0377

SDG 7111
Contact L.A. Johnson

REPORT GUIDE

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0377

ABOUT THE DATA SUMMARY SECTION

The Data Summary Section of a Data Package has all data, in several useful orders, necessary for first level, routine review of the data package for a Sample Delivery Group (SDG). This section follows the Data Package Narrative, which has an overview of the data package and a discussion of special problems. It is followed by the Raw Data Section, which has full details.

The Data Summary Section has several groups of reports:

SAMPLE SUMMARIES

The Sample and QC Summary Reports show all samples, including QC samples, reported in one SDG. These reports cross-reference client and lab sample identifiers.

PREPARATION BATCH SUMMARY

The Preparation Batch Summary Report shows all preparation batches (lab groupings reflecting how work was organized) relevant to the reported SDG with information necessary to check the completeness and consistency of the SDG.

WORK SUMMARY

The Work Summary Report shows all samples and work done on them relevant to the reported SDG.

METHOD BLANKS

The Method Blank Reports, one for each Method Blank relevant to the SDG, show all results and primary supporting information for the blanks.

LAB CONTROL SAMPLES

The Lab Control Sample Reports, one for each Lab Control Sample relevant to the SDG, show all results, recoveries and primary supporting information for these QC samples.

REPORT GUIDES

Page 1

SUMMARY DATA SECTION

Page 1

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 05/10/99

TMA / RICHMOND
SAMPLE DELIVERY GROUP H0377

SDG 7111
Contact L.A. Johnson

GUIDE, cont.

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0377

ABOUT THE DATA SUMMARY SECTION

DUPLICATES

The Duplicate Reports, one for each Duplicate and Original sample pair relevant to the SDG, show all results, differences and primary supporting information for these QC samples.

MATRIX SPIKES

The Matrix Spike Reports, one for each Spiked and Original sample pair relevant to the SDG, show all results, recoveries and primary supporting information for these QC samples.

DATA SHEETS

The Data Sheet Reports, one for each client sample in the SDG, show all results and primary supporting information for these samples.

METHOD SUMMARIES

The Method Summary Reports, one for each test used in the SDG, show all results, QC and method performance data for one analyte on one or two pages. (A test is a short code for the method used to do certain work to the client's specification.)

REPORT GUIDES

The Report Guides, one for each of the above groups of reports, have documentation on how to read the associated reports.

REPORT GUIDES

Page 2

SUMMARY DATA SECTION

Page 2

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 05/10/99

TMA/RICHMOND
SAMPLE DELIVERY GROUP H0377

SDG 7111
Contact L.A. Johnson

SAMPLE SUMMARY

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0377

CLIENT SAMPLE ID	LOCATION	MATRIX	LEVEL	LAB SAMPLE ID	SAF NO	CHAIN OF CUSTODY	COLLECTED
B0V1W7	100 B/C 116-B-12 deep zn	SOLID		N904039-01	B99-002	B99-002-79	04/01/99 08:45
B0V1W8	100 B/C 116-B-12 deep zn	SOLID		N904039-02	B99-002	B99-002-79	04/01/99 09:20
B0V1W9	100 B/C 116-B-12 deep zn	SOLID		N904039-03	B99-002	B99-002-79	04/01/99 09:20
B0V1X0	100 B/C 116-B-12 deep zn	SOLID		N904039-04	B99-002	B99-002-79	04/01/99 09:45
Method Blank		SOLID		N904039-06	B99-002		
Lab Control Sample		SOLID		N904039-05	B99-002		
Duplicate (N904039-01)	100 B/C 116-B-12 deep zn	SOLID		N904039-07	B99-002		04/01/99 08:45

SAMPLE SUMMARY

Page 1

SUMMARY DATA SECTION

Page 3

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CS
Version 3.06
Report date 05/10/99

TMA/RICHMOND
SAMPLE DELIVERY GROUP H0377

SDG 7111
Contact L.A. Johnson

QC SUMMARY

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0377

QC BATCH	CHAIN OF CUSTODY	CLIENT SAMPLE ID	MATRIX	% SOLIDS	SAMPLE AMOUNT	BASIS AMOUNT	DAYS SINCE RECEIVED	LAB COLL SAMPLE ID	DEPARTMENT SAMPLE ID
7111	B99-002-79	B0V1W7	SOLID	96.1			04/07/99 6	N904039-01	7111-001
		B0V1W8	SOLID	95.0			04/07/99 6	N904039-02	7111-002
		B0V1W9	SOLID	94.9			04/07/99 6	N904039-03	7111-003
		B0V1X0	SOLID	93.6			04/07/99 6	N904039-04	7111-004
		Method Blank	SOLID					N904039-06	7111-006
		Lab Control Sample	SOLID					N904039-05	7111-005
		Duplicate (N904039-01)	SOLID	96.1			04/07/99 6	N904039-07	7111-007

QC SUMMARY

Page 1

SUMMARY DATA SECTION

Page 4

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-QS
Version 3.06
Report date 05/10/99

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0377

SDG 7111
Contact L.A. Johnson

PREP BATCH SUMMARY

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0377

TEST	MATRIX	METHOD	PREPARATION	ERROR	PLANCHETS ANALYZED			QUALI-				
			BATCH	2σ %	CLIENT	MORE	RE	BLANK	LCS	DUP/ORIG	MS/ORIG	FIERS
Alpha Spectroscopy												
AM	SOLID	Americium 241 in Soil	6880-036	5.0	4			1	1	1/1		
PU	SOLID	Plutonium, Isotopic in Solids	6880-036	5.0	4			1	1	1/1		
U	SOLID	Uranium, Isotopic in Soil	6880-036	5.0	4			1	1	1/1		
Beta Counting												
SR	SOLID	Total Strontium in Soil	6880-036	10.0	4			1	1	1/1		
Gamma Spectroscopy												
GAM	SOLID	Gamma Scan	6880-036	15.0	4			1	1	1/1		
Liquid Scintillation Counting												
NI_L	SOLID	Nickel 63 in Soil	6880-036	10.0	4			1	1	1/1		

Duplicates and Matrix Spikes are those with original (Client) sample in this Sample Delivery Group.

Blank and LCS planchets are those in the same preparation batch as some Client, Duplicate or Spike sample.

TMA/RICHMOND
SAMPLE DELIVERY GROUP H0377

SDG 7111
 Contact L.A. Johnson

WORK SUMMARY

Client Hanford
 Contract TRB-SBB-207925
 Case no SDG-H0377

CLIENT SAMPLE ID		LAB SAMPLE ID									
LOCATION	MATRIX	COLLECTED			SUF-						
CUSTODY	SAF No	RECEIVED	PLANCHET	TEST	FIX	ANALYZED	REVIEWED	BY	METHOD		
BOV1W7		N904039-01	7111-001	AM		04/27/99	04/28/99	TAH	Americium 241 in Soil		
100 B/C 116-B-12 deep zn SOLID		04/01/99	7111-001	GAM		04/22/99	04/26/99	TAH	Gamma Scan		
B99-002-79	B99-002	04/07/99	7111-001	NI_L		04/24/99	04/27/99	TAH	Nickel 63 in Soil		
			7111-001	PU		04/26/99	04/27/99	TAH	Plutonium, Isotopic in Solids		
			7111-001	SR		04/21/99	04/28/99	TAH	Total Strontium in Soil		
			7111-001	U		04/27/99	04/27/99	TAH	Uranium, Isotopic in Soil		
BOV1W8		N904039-02	7111-002	AM		04/27/99	04/28/99	TAH	Americium 241 in Soil		
100 B/C 116-B-12 deep zn SOLID		04/01/99	7111-002	GAM		04/20/99	04/26/99	TAH	Gamma Scan		
B99-002-79	B99-002	04/07/99	7111-002	NI_L		04/25/99	04/27/99	TAH	Nickel 63 in Soil		
			7111-002	PU		04/26/99	04/27/99	TAH	Plutonium, Isotopic in Solids		
			7111-002	SR		04/21/99	04/28/99	TAH	Total Strontium in Soil		
			7111-002	U		04/21/99	04/27/99	TAH	Uranium, Isotopic in Soil		
BOV1W9		N904039-03	7111-003	AM		04/27/99	04/28/99	TAH	Americium 241 in Soil		
100 B/C 116-B-12 deep zn SOLID		04/01/99	7111-003	GAM		04/21/99	04/26/99	TAH	Gamma Scan		
B99-002-79	B99-002	04/07/99	7111-003	NI_L		04/25/99	04/27/99	TAH	Nickel 63 in Soil		
			7111-003	PU		04/26/99	04/27/99	TAH	Plutonium, Isotopic in Solids		
			7111-003	SR		04/21/99	04/28/99	TAH	Total Strontium in Soil		
			7111-003	U		04/21/99	04/27/99	TAH	Uranium, Isotopic in Soil		
BOV1X0		N904039-04	7111-004	AM		04/27/99	04/28/99	TAH	Americium 241 in Soil		
100 B/C 116-B-12 deep zn SOLID		04/01/99	7111-004	GAM		04/21/99	04/26/99	TAH	Gamma Scan		
B99-002-79	B99-002	04/07/99	7111-004	NI_L		04/25/99	04/27/99	TAH	Nickel 63 in Soil		
			7111-004	PU		04/26/99	04/27/99	TAH	Plutonium, Isotopic in Solids		
			7111-004	SR		04/21/99	04/28/99	TAH	Total Strontium in Soil		
			7111-004	U		04/21/99	04/27/99	TAH	Uranium, Isotopic in Soil		
Method Blank		N904039-06	7111-006	AM		04/27/99	04/28/99	TAH	Americium 241 in Soil		
	SOLID		7111-006	GAM		04/22/99	04/26/99	TAH	Gamma Scan		
	B99-002		7111-006	NI_L		04/25/99	04/27/99	TAH	Nickel 63 in Soil		
			7111-006	PU		04/26/99	05/04/99	TAH	Plutonium, Isotopic in Solids		
			7111-006	SR		04/21/99	04/28/99	TAH	Total Strontium in Soil		
			7111-006	U		04/21/99	04/27/99	TAH	Uranium, Isotopic in Soil		

WORK SUMMARY

Page 1

SUMMARY DATA SECTION

Page 6

Lab id TMANC
 Protocol Hanford
 Version Ver 1.0
 Form DVD-CWS
 Version 3.06
 Report date 05/10/99

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0377

SDG 7111

Contact L.A. Johnson

WORK SUMMARY, cont.

Client Hanford

Contract TRB-SBB-207925

Case no SDG-H0377

CLIENT SAMPLE ID		LAB SAMPLE ID									
LOCATION	MATRIX	COLLECTED		SUF-							
CUSTODY	SAF No	RECEIVED	PLANCHET	TEST	PIX	ANALYZED	REVIEWED	BY	METHOD		
Lab Control Sample		N904039-05	7111-005	AM		04/27/99	04/28/99	TAH	Americium 241 in Soil		
	SOLID		7111-005	GAM		04/21/99	04/26/99	TAH	Gamma Scan		
	B99-002		7111-005	NI_L		04/25/99	04/27/99	TAH	Nickel 63 in Soil		
			7111-005	PU		04/26/99	05/04/99	TAH	Plutonium, Isotopic in Solids		
			7111-005	SR		04/21/99	04/28/99	TAH	Total Strontium in Soil		
			7111-005	U		04/21/99	04/27/99	TAH	Uranium, Isotopic in Soil		
Duplicate (N904039-01)		N904039-07	7111-007	AM		04/27/99	05/04/99	TAH	Americium 241 in Soil		
100 B/C 116-B-12 deep zn SOLID		04/01/99	7111-007	GAM		04/23/99	04/26/99	TAH	Gamma Scan		
	B99-002	04/07/99	7111-007	NI_L		04/25/99	04/27/99	TAH	Nickel 63 in Soil		
			7111-007	PU		04/26/99	04/27/99	TAH	Plutonium, Isotopic in Solids		
			7111-007	SR		04/21/99	04/28/99	TAH	Total Strontium in Soil		
			7111-007	U		04/26/99	04/27/99	TAH	Uranium, Isotopic in Soil		

COUNTS OF TESTS BY SAMPLE TYPE

TEST	SAF No	METHOD	REFERENCE	CLIENT	MORE	RE	BLANK	LCS	DUP	SPIKE	TOTAL
AM	B99-002	Americium 241 in Soil	AM/CMPLATE	4			1	1	1		7
GAM	B99-002	Gamma Scan	GAMMAHI	4			1	1	1		7
NI_L	B99-002	Nickel 63 in Soil	NI63LSC	4			1	1	1		7
PU	B99-002	Plutonium, Isotopic in Solids	PUPLATE	4			1	1	1		7
SR	B99-002	Total Strontium in Soil		4			1	1	1		7
U	B99-002	Uranium, Isotopic in Soil	UPLATE	4			1	1	1		7
TOTALS				24			6	6	6		42

WORK SUMMARY

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SUMMARY DATA SECTION

Page 7

Lab id TMANC

Protocol Hanford

Version Ver 1.0

Form DVD-CNS

Version 3.06

Report date 05/10/99

TMA / RICHMOND
SAMPLE DELIVERY GROUP H0377

N904039-06

Method Blank

METHOD BLANK

SDG <u>7111</u>	Client/Case no <u>Hanford</u>	SDG- <u>H0377</u>
Contact <u>L.A. Johnson</u>	Case no <u>TRB-SBB-207925</u>	
Lab sample id <u>N904039-06</u>	Client sample id <u>Method Blank</u>	
Dept sample id <u>7111-006</u>	Material/Matrix <u>SOLID</u>	
	SAF No <u>B99-002</u>	

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Uranium 233/234	U-233/234	0.058	0.047	0.089	0.30	U	U
Uranium 235	15117-96-1	0	0.028	0.11	0.30	U	U
Uranium 238	U-238	0	0.023	0.089	0.30	U	U
Plutonium 238	13981-16-3	0.003	0.008	0.014	0.050	U	PU
Plutonium 239/240	PU-239/240	0	0.005	0.014	0.050	U	PU
Nickel 63	13981-37-8	2.30	2.9	4.8	20	U	NI_L
Americium 241	14596-10-2	0.006	0.012	0.024	0.050	U	AM
Total Strontium	SR-RAD	-0.013	0.11	0.16	1.0	U	SR
Potassium 40	13966-00-2	U		0.10		U	GAM
Cobalt 60	10198-40-0	U		0.010	0.050	U	GAM
Cesium 137	10045-97-3	U		0.010	0.050	U	GAM
Europium 152	14683-23-9	U		0.020	0.10	U	GAM
Europium 154	15585-10-1	U		0.030	0.10	U	GAM
Europium 155	14391-16-3	U		0.020	0.10	U	GAM
Americium 241	14596-10-2	U		0.008		U	GAM
Uranium 238	U-238	U		1.0		U	GAM
Uranium 235	15117-96-1	U		0.030		U	GAM

100 BC Areas-Full Protocol

QC-BLANK 30496

METHOD BLANKS

Page 1

SUMMARY DATA SECTION

Page 8

Lab id <u>TMANC</u>
Protocol <u>Hanford</u>
Version <u>Ver 1.0</u>
Form <u>DVD-DS</u>
Version <u>3.06</u>
Report date <u>05/10/99</u>

TMA/RICHMOND
SAMPLE DELIVERY GROUP H0377

N904039-05

Lab Control Sample

LAB CONTROL SAMPLE

SDG <u>7111</u>	Client/Case no <u>Hanford</u>	SDG-H0377
Contact <u>L.A. Johnson</u>	Case no <u>TRB-SBB-207925</u>	
Lab sample id <u>N904039-05</u>	Client sample id <u>Lab Control Sample</u>	
Dept sample id <u>7111-005</u>	Material/Matrix <u>SOLID</u>	
	SAF No <u>B99-002</u>	

ANALYTE	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST	ADDED pCi/g	2σ ERR pCi/g	REC %	3σ LMTS (TOTAL)	PROTOCOL LIMITS
Uranium 233/234	4.76	0.57	0.29	0.30		U	5.32	0.21	89	82-118	80-120
Uranium 235	4.49	0.55	0.074	0.30		U	4.35	0.17	103	79-121	80-120
Uranium 238	5.70	0.65	0.28	0.30		U	5.49	0.22	104	80-120	80-120
Plutonium 238	4.61	0.28	0.011	0.050		PU	5.03	0.20	92	88-112	80-120
Plutonium 239/240	4.88	0.29	0.009	0.050		PU	5.29	0.21	92	88-112	80-120
Nickel 63	196	4.4	2.5	20		NI_L	202	8.1	97	84-116	
Americium 241	5.44	0.48	0.023	0.050		AM	5.75	0.23	95	84-116	80-120
Total Strontium	12.8	0.43	0.15	1.0		SR	12.6	0.50	102	83-117	
Cobalt 60	0.300	0.016	0.007	0.050		GAM	0.304	0.012	99	76-124	80-120
Cesium 137	0.380	0.014	0.008	0.050		GAM	0.381	0.015	100	76-124	80-120

100 BC Areas-Full Protocol

QC-LCS 30495

TMA/RICHMOND
SAMPLE DELIVERY GROUP H0377

N904039-07

B0V1W7

DUPLICATE

SDG <u>7111</u>		Client/Case no <u>Hanford</u> <u>SDG-H0377</u>	
Contact <u>L.A. Johnson</u>		Case no <u>TRB-SBB-207925</u>	
DUPLICATE		ORIGINAL	
Lab sample id <u>N904039-07</u>	Lab sample id <u>N904039-01</u>	Client sample id <u>B0V1W7</u>	
Dept sample id <u>7111-007</u>	Dept sample id <u>7111-001</u>	Location/Matrix <u>100 B/C 116-B-12 deep zn SOLID</u>	
	Received <u>04/07/99</u>	Collected <u>04/01/99 08:45</u>	
% solids <u>96.1</u>	% solids <u>96.1</u>	Custody/SAF No <u>B99-002-79</u> <u>B99-002</u>	

ANALYTE	DUPLICATE pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST	ORIGINAL pCi/g	2σ ERR (COUNT)	MDA pCi/g	QUALI- FIERS	RPD %	3σ PROT TOT LIMIT
Uranium 233/234	0.493	0.055	0.020	0.30		U	0.489	0.14	0.075		1	47
Uranium 235	0.040	0.017	0.013	0.30	J	U	0.024	0.024	0.091	U	50	138
Uranium 238	0.481	0.054	0.015	0.30		U	0.479	0.14	0.075		0	48
Plutonium 238	-0.003	0.037	0.067	0.050	U	PU	-0.006	0.017	0.037	U	-	
Plutonium 239/240	0	0.025	0.047	0.050	U	PU	0.019	0.017	0.027	U	-	
Nickel 63	1.15	1.8	3.0	20	U	NI_L	2.20	1.8	2.9	U	-	
Americium 241	0	0.042	0.078	0.050	U	AM	0.007	0.028	0.054	U	-	
Total Strontium	0.027	0.11	0.15	1.0	U	SR	0.044	0.11	0.15	U	-	
Potassium 40	12.0	0.40	0.20			GAM	12.1	0.39	0.19		1	33
Cobalt 60	U		0.020	0.050	U	GAM	U		0.018	U	-	
Cesium 137	U		0.020	0.050	U	GAM	0.019	0.012	0.016	J	5	182
Europium 152	U		0.040	0.10	U	GAM	U		0.045	U	-	
Europium 154	U		0.070	0.10	U	GAM	U		0.064	U	-	
Europium 155	0.025	0.023	0.040	0.10	U	GAM	U		0.047	U	-	
Radium 226	0.460	0.036	0.030	0.10		GAM	0.472	0.037	0.036		3	36
Radium 228	0.660	0.096	0.090	0.20		GAM	0.657	0.086	0.086		0	43
Thorium 228	0.650	0.022	0.020			GAM	0.609	0.023	0.022		7	33
Thorium 232	0.660	0.096	0.090			GAM	0.657	0.086	0.086		0	43
Americium 241	U		0.020		U	GAM	U		0.070	U	-	
Uranium 238	U		2.0		U	GAM	U		2.2	U	-	
Uranium 235	U		0.10		U	GAM	U		0.076	U	-	

100 BC Areas-Full Protocol

QC-DUP#1 30497

TMA / RICHMOND
SAMPLE DELIVERY GROUP H0377

N904039-01

BOV1W7

DATA SHEET

SDG <u>7111</u>	Client/Case no <u>Hanford</u>	SDG-H0377
Contact <u>L.A. Johnson</u>	Case no <u>TRB-SBB-207925</u>	
Lab sample id <u>N904039-01</u>	Client sample id <u>BOV1W7</u>	
Dept sample id <u>7111-001</u>	Location/Matrix <u>100 B/C 116-B-12 deep zn SOLID</u>	
Received <u>04/07/99</u>	Collected <u>04/01/99 08:45</u>	
% solids <u>96.1</u>	Custody/SAF No <u>B99-002-79</u>	<u>B99-002</u>

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Uranium 233/234	U-233/234	0.489	0.14	0.075	0.30		U
Uranium 235	15117-96-1	0.024	0.024	0.091	0.30	U	U
Uranium 238	U-238	0.479	0.14	0.075	0.30		U
Plutonium 238	13981-16-3	-0.006	0.017	0.037	0.050	U	PU
Plutonium 239/240	PU-239/240	0.019	0.017	0.027	0.050	U	PU
Nickel 63	13981-37-8	2.20	1.8	2.9	20	U	NI_L
Americium 241	14596-10-2	0.007	0.028	<u>0.054</u>	0.050	U	AM
Total Strontium	SR-RAD	0.044	0.11	0.15	1.0	U	SR
Potassium 40	13966-00-2	12.1	0.39	0.19			GAM
Cobalt 60	10198-40-0	U		0.018	0.050	U	GAM
Cesium 137	10045-97-3	0.019	0.012	0.016	0.050	J	GAM
Europium 152	14683-23-9	U		0.045	0.10	U	GAM
Europium 154	15585-10-1	U		0.064	0.10	U	GAM
Europium 155	14391-16-3	U		0.047	0.10	U	GAM
Radium 226	13982-63-3	0.472	0.037	0.036	0.10		GAM
Radium 228	15262-20-1	0.657	0.086	0.086	0.20		GAM
Thorium 228	14274-82-9	0.609	0.023	0.022			GAM
Thorium 232	TH-232	0.657	0.086	0.086			GAM
Americium 241	14596-10-2	U		0.070		U	GAM
Uranium 238	U-238	U		2.2		U	GAM
Uranium 235	15117-96-1	U		0.076		U	GAM

100 BC Areas-Full Protocol

DATA SHEETS

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SUMMARY DATA SECTION

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Lab id <u>TMANC</u>
Protocol <u>Hanford</u>
Version <u>Ver 1.0</u>
Form <u>DVD-DS</u>
Version <u>3.06</u>
Report date <u>05/10/99</u>

TMA / RICHMOND
SAMPLE DELIVERY GROUP H0377

N904039-02

B0V1W8

DATA SHEET

SDG <u>7111</u>	Client/Case no <u>Hanford</u>	SDG-H0377
Contact <u>L.A. Johnson</u>	Case no <u>TRB-SBB-207925</u>	
Lab sample id <u>N904039-02</u>	Client sample id <u>B0V1W8</u>	
Dept sample id <u>7111-002</u>	Location/Matrix <u>100 B/C 116-B-12 deep zn SOLID</u>	
Received <u>04/07/99</u>	Collected <u>04/01/99 09:20</u>	
% solids <u>95.0</u>	Custody/SAP No <u>B99-002-79</u>	<u>B99-002</u>

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Uranium 233/234	U-233/234	0.485	0.16	0.086	0.30		U
Uranium 235	15117-96-1	0.014	0.027	0.10	0.30	U	U
Uranium 238	U-238	0.688	0.19	0.086	0.30		U
Plutonium 238	13981-16-3	0	0.018	0.037	0.050	U	PU
Plutonium 239/240	PU-239/240	0.018	0.018	0.033	0.050	U	PU
Nickel 63	13981-37-8	1.41	1.8	3.0	20	U	NI_L
Americium 241	14596-10-2	0.011	0.046	0.11	0.050	U	AM
Total Strontium	SR-RAD	0.106	0.10	0.13	1.0	U	SR
Potassium 40	13966-00-2	10.7	0.38	0.18			GAM
Cobalt 60	10198-40-0	U		0.018	0.050	U	GAM
Cesium 137	10045-97-3	U		0.019	0.050	U	GAM
Europium 152	14683-23-9	U		0.042	0.10	U	GAM
Europium 154	15585-10-1	U		0.059	0.10	U	GAM
Europium 155	14391-16-3	U		0.045	0.10	U	GAM
Radium 226	13982-63-3	0.383	0.033	0.033	0.10		GAM
Radium 228	15262-20-1	0.596	0.083	0.084	0.20		GAM
Thorium 228	14274-82-9	0.516	0.022	0.020			GAM
Thorium 232	TH-232	0.596	0.083	0.084			GAM
Americium 241	14596-10-2	U		0.066		U	GAM
Uranium 238	U-238	U		2.2		U	GAM
Uranium 235	15117-96-1	U		0.072		U	GAM

100 BC Areas-Full Protocol

Lab id <u>TMANC</u>
Protocol <u>Hanford</u>
Version <u>Ver 1.0</u>
Form <u>DVD-DS</u>
Version <u>3.06</u>
Report date <u>05/10/99</u>

TMA / RICHMOND
SAMPLE DELIVERY GROUP H0377

N904039-03

BOV1W9

DATA SHEET

SDG <u>7111</u>	Client/Case no <u>Hanford</u>	SDG-H0377
Contact <u>L.A. Johnson</u>	Case no <u>TRB-SBB-207925</u>	
Lab sample id <u>N904039-03</u>	Client sample id <u>BOV1W9</u>	
Dept sample id <u>7111-003</u>	Location/Matrix <u>100 B/C 116-B-12 deep zn SOLID</u>	
Received <u>04/07/99</u>	Collected <u>04/01/99 09:20</u>	
% solids <u>94.9</u>	Custody/SAF No <u>B99-002-79</u>	<u>B99-002</u>

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Uranium 233/234	U-233/234	0.494	0.14	0.063	0.30		U
Uranium 235	15117-96-1	0.050	0.040	0.076	0.30	U	U
Uranium 238	U-238	0.412	0.12	0.063	0.30		U
Plutonium 238	13981-16-3	0.012	0.023	0.048	0.050	U	PU
Plutonium 239/240	PU-239/240	-0.004	0.023	0.048	0.050	U	PU
Nickel 63	13981-37-8	1.04	1.6	2.6	20	U	NI_L
Americium 241	14596-10-2	-0.008	0.016	0.060	0.050	U	AM
Total Strontium	SR-RAD	0.058	0.098	0.13	1.0	U	SR
Potassium 40	13966-00-2	11.6	0.46	0.19			GAM
Cobalt 60	10198-40-0	U		0.024	0.050	U	GAM
Cesium 137	10045-97-3	U		0.021	0.050	U	GAM
Europium 152	14683-23-9	U		0.048	0.10	U	GAM
Europium 154	15585-10-1	U		0.079	0.10	U	GAM
Europium 155	14391-16-3	U		0.042	0.10	U	GAM
Radium 226	13982-63-3	0.422	0.041	0.038	0.10		GAM
Radium 228	15262-20-1	0.618	0.11	0.11	0.20		GAM
Thorium 228	14274-82-9	0.584	0.024	0.022			GAM
Thorium 232	TH-232	0.618	0.11	0.11			GAM
Americium 241	14596-10-2	U		0.027		U	GAM
Uranium 238	U-238	U		2.8		U	GAM
Uranium 235	15117-96-1	U		0.066		U	GAM

100 BC Areas-Full Protocol

Lab id <u>TMANC</u>
Protocol <u>Hanford</u>
Version <u>Ver 1.0</u>
Form <u>DVD-DS</u>
Version <u>3.06</u>
Report date <u>05/10/99</u>

TMA / RICHMOND
SAMPLE DELIVERY GROUP H0377

N904039-04

BOVIX0

DATA SHEET

SDG <u>7111</u>	Client/Case no <u>Hanford</u>	SDG <u>H0377</u>
Contact <u>L.A. Johnson</u>	Case no <u>TRB-SBB-207925</u>	
Lab sample id <u>N904039-04</u>	Client sample id <u>BOVIX0</u>	
Dept sample id <u>7111-004</u>	Location/Matrix <u>100 B/C 116-B-12 deep zn SOLID</u>	
Received <u>04/07/99</u>	Collected <u>04/01/99 09:45</u>	
% solids <u>93.6</u>	Custody/SAF No <u>B99-002-79</u>	<u>B99-002</u>

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Uranium 233/234	U-233/234	0.616	0.19	0.10	0.30		U
Uranium 235	15117-96-1	0.016	0.032	0.12	0.30	U	U
Uranium 238	U-238	0.630	0.19	0.10	0.30		U
Plutonium 238	13981-16-3	0.003	0.011	0.020	0.050	U	PU
Plutonium 239/240	PU-239/240	-0.003	0.005	0.020	0.050	U	PU
Nickel 63	13981-37-8	2.12	1.6	2.6	20	U	NI_L
Americium 241	14596-10-2	0.006	0.038	<u>0.079</u>	0.050	U	AM
Total Strontium	SR-RAD	0.070	0.11	0.14	1.0	U	SR
Potassium 40	13966-00-2	11.5	0.48	0.22			GAM
Cobalt 60	10198-40-0	U		0.022	0.050	U	GAM
Cesium 137	10045-97-3	U		0.021	0.050	U	GAM
Europium 152	14683-23-9	U		0.052	0.10	U	GAM
Europium 154	15585-10-1	U		0.076	0.10	U	GAM
Europium 155	14391-16-3	U		0.057	0.10	U	GAM
Radium 226	13982-63-3	0.411	0.038	0.038	0.10		GAM
Radium 228	15262-20-1	0.648	0.099	0.10	0.20		GAM
Thorium 228	14274-82-9	0.616	0.027	0.025			GAM
Thorium 232	TH-232	0.648	0.099	0.10			GAM
Americium 241	14596-10-2	U		0.084		U	GAM
Uranium 238	U-238	U		2.8		U	GAM
Uranium 235	15117-96-1	U		0.090		U	GAM

100 BC Areas-Full Protocol

DATA SHEETS

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Lab id <u>TMANC</u>
Protocol <u>Hanford</u>
Version <u>Ver 1.0</u>
Form <u>DVP-DS</u>
Version <u>3.06</u>
Report date <u>05/10/99</u>

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0377

Test AM Matrix SOLIDSDG 7111Contact L.A. Johnson

METHOD SUMMARY

AMERICIUM 241 IN SOIL

ALPHA SPECTROSCOPY

Client HanfordContract TRB-SBB-207925Case no SDG-H0377

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST FIX	SUF- PLANCHET	Americium 241
Preparation batch 6880-036				
BOV1W7	N904039-01		7111-001	U
BOV1W8	N904039-02		7111-002	U
BOV1W9	N904039-03		7111-003	U
BOV1X0	N904039-04		7111-004	U
BLK (QC ID=30496)	N904039-06		7111-006	U
LCS (QC ID=30495)	N904039-05		7111-005	ok
Duplicate (N904039-01)	N904039-07		7111-007	- U

Nominal values and limits from method RDLs (pCi/g) 0.050
100 BC Areas-Full Protocol

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST FIX	SUF- TEST FIX	MDA pCi/g	ALIQ g	PREP FAC	DILU- TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT keV	DAYS HELD	ANAL- PREPARED	YZED	DETECTOR
Preparation batch 6880-036 2σ prep error 5.0 % Reference Lab Notebook 6880 pg.36																
BOV1W7	N904039-01			<u>0.054</u>	<u>0.500</u>			83	<u>406</u>				26	04/26/99	04/27	SS-013
BOV1W8	N904039-02			<u>0.11</u>	<u>0.500</u>			51	<u>406</u>				26	04/26/99	04/27	SS-015
BOV1W9	N904039-03			<u>0.060</u>	<u>0.500</u>			75	<u>406</u>				26	04/26/99	04/27	SS-016
BOV1X0	N904039-04			<u>0.079</u>	<u>0.500</u>			93	<u>405</u>				26	04/26/99	04/27	SS-009
BLK (QC ID=30496)	N904039-06			0.024	1.00			97	<u>405</u>					04/26/99	04/27	SS-011
LCS (QC ID=30495)	N904039-05			0.023	1.00			96	<u>405</u>					04/26/99	04/27	SS-010
Duplicate (N904039-01)	N904039-07			<u>0.078</u>	<u>0.500</u>			82	<u>405</u>				26	04/26/99	04/27	SS-012

(QC ID=30497)

Nominal values and limits from method 0.050 1.00 20-105 700 100 180

METHOD SUMMARIES

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Lab id TMANCProtocol HanfordVersion Ver 1.0Form DVD-CMSVersion 3.06Report date 05/10/99

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0377

Test AM Matrix SOLID

SDG 7111

Contact L.A. Johnson

METHOD SUMMARY, cont.

AMERICIUM 241 IN SOIL

ALPHA SPECTROSCOPY

Client Hanford

Contract TRB-SBB-207925

Case no SDG-H0377

PROCEDURES	REFERENCE	AM/CMPLATE
	EP-060	Soil Preparation, rev 0
	EP-070	Soil Dissolution, rev 0
	EP-940	Plutonium Purification, rev 0
	EP-960	Americium-Curium Purification, rev 0
	EP-008	Heavy Elements Electroplating, rev 0

AVERAGES \pm 2 SD

MDA 0.061 \pm 0.063

FOR 7 SAMPLES

YIELD 82 \pm 32

METHOD SUMMARIES

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Lab id TMANC

Protocol Hanford

Version Ver 1.0

Form DVD-CMS

Version 3.06

Report date 05/10/99

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0377

Test PU Matrix SOLID

SDG 7111

Contact L.A. Johnson

METHOD SUMMARY

PLUTONIUM, ISOTOPIC IN SOLIDS

ALPHA SPECTROSCOPY

Client Hanford

Contract TRB-SBB-207925

Case no SDG-H0377

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST FIX	SUF- PLANCHET	Plutonium 238	Plutonium 239/240
Preparation batch 6880-036					
BOV1W7	N904039-01		7111-001	U	U
BOV1W8	N904039-02		7111-002	U	U
BOV1W9	N904039-03		7111-003	U	U
BOV1X0	N904039-04		7111-004	U	U
BLK (QC ID=30496)	N904039-06		7111-006	U	U
LCS (QC ID=30495)	N904039-05		7111-005	ok	ok
Duplicate (N904039-01)	N904039-07		7111-007	- U	- U

Nominal values and limits from method RDLs (pCi/g) 0.050 0.050
100 BC Areas-Full Protocol

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST FIX	SUF- pCi/g	MAX MDA pCi/g	ALIQ g	PREP FAC	DILU- TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	ANAL- PREPARED	YZED	DETECTOR
Preparation batch 6880-036 2σ prep error 5.0 % Reference Lab Notebook 6880 pg.36																
BOV1W7	N904039-01		0.037	0.500				80	1006				25	04/26/99	04/26	SS-003
BOV1W8	N904039-02		0.037	0.500				78	1006				25	04/26/99	04/26	SS-005
BOV1W9	N904039-03		0.048	0.500				61	1006				25	04/26/99	04/26	SS-007
BOV1X0	N904039-04		0.020	0.500				88	1006				25	04/26/99	04/26	SS-008
BLK (QC ID=30496)	N904039-06		0.014	1.00				95	1005					04/26/99	04/26	SS-011
LCS (QC ID=30495)	N904039-05		0.011	1.00				98	1005					04/26/99	04/26	SS-013
Duplicate (N904039-01)	N904039-07		0.067	0.500				76	1002				25	04/26/99	04/26	SS-042

(QC ID=30497)

Nominal values and limits from method 0.050 1.00 20-105 10 100 180

PROCEDURES	REFERENCE	PUPLATE
EP-060		Soil Preparation, rev 0
EP-070		Soil Dissolution, rev 0
EP-940		Plutonium Purification, rev 0
EP-008		Heavy Elements Electroplating, rev 0

AVERAGES ± 2 SD	MDA	0.033 ± 0.040
FOR 7 SAMPLES	YIELD	82 ± 25

METHOD SUMMARIES

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SUMMARY DATA SECTION

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Lab id TMANC

Protocol Hanford

Version Ver 1.0

Form DVD-CMS

Version 3.06

Report date 05/10/99

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0377

Test U Matrix SOLIDSDG 7111Contact L.A. Johnson

METHOD SUMMARY

URANIUM, ISOTOPIC IN SOIL

ALPHA SPECTROSCOPY

Client HanfordContract TRB-SBB-207925Case no SDG-H0377

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF- FIX	PLANCHET	1: Uranium 233/234	2: Uranium 235	3: Uranium 238	RESULT RATIOS (%)			
								1+3	2σ	2+3	2σ
Preparation batch 6880-036											
BOV1W7	N904039-01			7111-001	0.489	U	0.479	102	42	5	5
BOV1W8	N904039-02			7111-002	0.485	U	0.688	70	30	2	4
BOV1W9	N904039-03			7111-003	0.494	U	0.412	120	49	12	10
BOV1X0	N904039-04			7111-004	0.616	U	0.630	98	42	3	5
BLK (QC ID=30496)	N904039-06			7111-006	U	U	U				
LCS (QC ID=30495)	N904039-05			7111-005	ok	ok	ok				
Duplicate (N904039-01)	N904039-07			7111-007	ok	ok	J ok	102	16	8	4
Nominal values and limits from method											
				RDLs (pCi/g)	0.30	0.30	0.30	100		4	
100 BC Areas-Full Protocol								Averages	99	6	

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF- FIX	MAX MDA pCi/g	ALIQ g	PREP PAC	DILU- TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	ANAL- PREPARED	YZED	DETECTOR
Preparation batch 6880-036 2σ prep error 5.0 % Reference Lab Notebook 6880 pg.36																
BOV1W7	N904039-01			0.091	1.00			81		150			26	04/22/99	04/27	SS-055
BOV1W8	N904039-02			0.10	1.00			74		152			21	04/22/99	04/21	SS-002
BOV1W9	N904039-03			0.076	1.00			86		152			21	04/22/99	04/21	SS-003
BOV1X0	N904039-04			0.12	1.00			59		152			21	04/22/99	04/21	SS-005
BLK (QC ID=30496)	N904039-06			0.11	1.00			69		152			04/22/99	04/21	SS-007	
LCS (QC ID=30495)	N904039-05			0.29	1.00			96		152			04/22/99	04/21	SS-006	
Duplicate (N904039-01)	N904039-07			0.020	1.00			85		998			25	04/22/99	04/26	SS-056
(QC ID=30497)																
Nominal values and limits from method																
				0.30	1.00			30-105		150	100		180			

PROCEDURES	REFERENCE	UPLATE
EP-060		Soil Preparation, rev 0
EP-070		Soil Dissolution, rev 0
EP-910		Uranium Purification, rev 0
EP-008		Heavy Elements Electroplating, rev 0

AVERAGES ± 2 SD	MDA <u>0.12</u> ± <u>0.17</u>
FOR 7 SAMPLES	YIELD <u>79</u> ± <u>25</u>

METHOD SUMMARIES

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TMA/RICHMOND

SAMPLE DELIVERY GROUP H0377

Test SR Matrix SOLIDSDG 7111Contact L.A. Johnson

METHOD SUMMARY

TOTAL STRONTIUM IN SOIL

BETA COUNTING

Client HanfordContract TRB-SBB-207925Case no SDG-H0377

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST FIX	SUF- PLANCHET	Total Strontium
Preparation batch 6880-036				
BOV1W7	N904039-01		7111-001	U
BOV1W8	N904039-02		7111-002	U
BOV1W9	N904039-03		7111-003	U
BOV1X0	N904039-04		7111-004	U
BLK (QC ID=30496)	N904039-06		7111-006	U
LCS (QC ID=30495)	N904039-05		7111-005	ok
Duplicate (N904039-01)	N904039-07		7111-007	- U

Nominal values and limits from method RDLs (pCi/g) 1.0
100 BC Areas-Full Protocol

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST FIX	SUF- pCi/g	MAX MDA g	ALIQ g	PREP FAC	DILU- TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	ANAL- PREPARED	YZED	DETECTOR
Preparation batch 6880-036 2σ prep error 10.0 % Reference Lab Notebook 6880 pg.36																
BOV1W7	N904039-01		0.15	1.00				91		400			21	04/22/99	04/21	GRB-201
BOV1W8	N904039-02		0.13	1.00				94		400			21	04/22/99	04/21	GRB-202
BOV1W9	N904039-03		0.13	1.00				89		400			21	04/22/99	04/21	GRB-203
BOV1X0	N904039-04		0.14	1.00				92		400			21	04/22/99	04/21	GRB-204
BLK (QC ID=30496)	N904039-06		0.16	1.00				84		400				04/22/99	04/21	GRB-230
LCS (QC ID=30495)	N904039-05		0.15	1.00				82		200				04/22/99	04/21	GRB-219
Duplicate (N904039-01)	N904039-07		0.15	1.00				92		400			21	04/22/99	04/21	GRB-231
(QC ID=30497)																
Nominal values and limits from method			1.0	1.00						100			180			

PROCEDURES RP-500 Strontium - Initial Separation, rev 0
RP-519 Strontium-89,90 Demounting and Yttrium
Purification, rev 0

AVERAGES ± 2 SD MDA 0.14 ± 0.023
FOR 7 SAMPLES YIELD 89 ± 9

METHOD SUMMARIES

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TMA/RICHMOND
SAMPLE DELIVERY GROUP H0377

Test GAM Matrix SOLID
SDG 7111
Contact L.A. Johnson

METHOD SUMMARY
GAMMA SCAN
GAMMA SPECTROSCOPY

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0377

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST FIX	SUF- PLANCHET	Cobalt 60	Cesium 137
Preparation batch 6880-036					
BOV1W7	N904039-01		7111-001	U	0.019 J
BOV1W8	N904039-02		7111-002	U	U
BOV1W9	N904039-03		7111-003	U	U
BOV1X0	N904039-04		7111-004	U	U
BLK (QC ID=30496)	N904039-06		7111-006	U	U
LCS (QC ID=30495)	N904039-05		7111-005	ok	ok
Duplicate (N904039-01)	N904039-07		7111-007	- U	ok U

Nominal values and limits from method RDLs (pCi/g) 0.050 0.050
100 BC Areas-Full Protocol

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST FIX	SUF- pCi/g	MAX MDA g	ALIQ g	PREP FAC	DILU- TION	YIELD %	BFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	ANAL- PREPARED	YZED	DETECTOR
Preparation batch 6880-036 2σ prep error 15.0 % Reference Lab Notebook 6880 pg.36																
BOV1W7	N904039-01		0.041	837						586			21	04/11/99	04/22	02,03,00
BOV1W8	N904039-02		0.041	915						489			19	04/11/99	04/20	02,03,00
BOV1W9	N904039-03		0.066	818						448			20	04/11/99	04/21	02,01,00
BOV1X0	N904039-04		0.051	796						400			20	04/11/99	04/21	02,03,00
BLK (QC ID=30496)	N904039-06		0.020	750						405				04/11/99	04/22	01,01,00
LCS (QC ID=30495)	N904039-05		0.008	750						403				04/11/99	04/21	01,04,00
Duplicate (N904039-01) (QC ID=30497)	N904039-07		0.060	837						650			22	04/11/99	04/23	02,01,00

Nominal values and limits from method 0.050 750 100 180

PROCEDURES REFERENCE GAMMAHI
EP-060 Soil Preparation, rev 0
EP-100 Ge(Li) Preparation for Environmental Samples,
rev 0

AVERAGES ± 2 SD MDA 0.041 ± 0.042
FOR 7 SAMPLES YIELD _____ ± _____

METHOD SUMMARIES

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SUMMARY DATA SECTION

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Lab id TMANC
Protocol Hanford
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TMA/RICHMOND

SAMPLE DELIVERY GROUP H0377

Test NI L Matrix SOLIDSDG 7111Contact L.A. Johnson

METHOD SUMMARY

NICKEL 63 IN SOIL

LIQUID SCINTILLATION COUNTING

Client HanfordContract TRB-SBB-207925Case no SDG-H0377

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST FIX	SUF- PLANCHET	Nickel 63
Preparation batch 6880-036				
BOV1W7	N904039-01		7111-001	U
BOV1W8	N904039-02		7111-002	U
BOV1W9	N904039-03		7111-003	U
BOV1X0	N904039-04		7111-004	U
BLK (QC ID=30496)	N904039-06		7111-006	U
LCS (QC ID=30495)	N904039-05		7111-005	ok
Duplicate (N904039-01)	N904039-07		7111-007	- U

Nominal values and limits from method RDLs (pCi/g) 20
100 BC Areas-Full Protocol

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST FIX	SUF- pCi/g	MDA g	ALIQ g	PREP FAC	DILU- TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	ANAL- PREPARED	YZED	DETECTOR
Preparation batch 6880-036 2σ prep error 10.0 % Reference Lab Notebook 6880 pg.36																
BOV1W7	N904039-01		2.9	0.500				71	100				23	04/23/99	04/24	LSC-004
BOV1W8	N904039-02		3.0	0.500				66	100				24	04/23/99	04/25	LSC-004
BOV1W9	N904039-03		2.6	0.500				77	100				24	04/23/99	04/25	LSC-004
BOV1X0	N904039-04		2.6	0.500				78	100				24	04/23/99	04/25	LSC-004
BLK (QC ID=30496)	N904039-06		4.8	0.500				42	100					04/23/99	04/25	LSC-004
LCS (QC ID=30495)	N904039-05		2.5	0.500				77	100					04/23/99	04/25	LSC-004
Duplicate (N904039-01)	N904039-07		3.0	0.500				67	100				24	04/23/99	04/25	LSC-004
(QC ID=30497)																

Nominal values and limits from method 20 0.500 10 180

PROCEDURES REFERENCE NI63LSC
EP-060 Soil Preparation, rev 0
EP-431 Nickel-63 Purification, rev 0

AVERAGES ± 2 SD MDA 3.1 ± 1.6
FOR 7 SAMPLES YIELD 68 ± 25

METHOD SUMMARIES

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TMA / RICHMOND
SAMPLE DELIVERY GROUP H0377

SDG 7111
Contact L.A. Johnson

REPORT GUIDE

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0377

SAMPLE SUMMARY

The Sample and QC Summary Reports show all samples, including QC samples, reported in one Sample Delivery Group (SDG).

The Sample Summary Report fully identifies client samples and gives the corresponding lab sample identification. The QC Summary Report shows at the sample level how the lab organized the samples into batches and generated QC samples. The Preparation Batch and Method Summary Reports show this at the analysis level.

The following notes apply to these reports:

- * LAB SAMPLE ID is the lab's primary identification for a sample.
- * DEPARTMENT SAMPLE ID is an alternate lab id, for example one assigned by a radiochemistry department in a lab.
- * CLIENT SAMPLE ID is the client's primary identification for a sample. It includes any sample preparation done by the client that is necessary to identify the sample.
- * QC BATCH is a lab assigned code that groups samples to be processed and QCed together. These samples should have similar matrices.

QC BATCH is not necessarily the same as SDG, which reflects samples received and reported together.

- * All Lab Control Samples, Method Blanks, Duplicates and Matrix Spikes are shown that QC any of the samples. Due to possible reanalyses, not all results for all these QC samples may be relevant to the SDG. The Lab Control Sample, Method Blank, Duplicate, Matrix Spike and Method Summary Reports detail these relationships.

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SAMPLE DELIVERY GROUP H0377

SDG 7111
Contact L.A. Johnson

REPORT GUIDE

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0377

PREPARATION BATCH SUMMARY

The Preparation Batch Summary Report shows all preparation batches in one Sample Delivery Group (SDG) with information necessary to check the completeness and consistency of the SDG.

The following notes apply to this report:

- * The preparation batches are shown in the same order as the Method Summary Reports are printed.
- * Only analyses of planchets relevant to the SDG are included.
- * Each preparation batch should have at least one Method Blank and LCS in it to validate client sample results.
- * The QUALIFIERS shown are all qualifiers other than U, J, B, L and H that occur on any analysis in the preparation batch. The Method Summary Report has these qualifiers on a per sample basis.

These qualifiers should be reviewed as follows:

- X Some data has been manually entered or modified.
Transcription errors are possible.
- P One or more results are 'preliminary'. The data is not ready for final reporting.
- 2 There were two or more results for one analyte on one planchet imported at one time. The results in DVD may not be the same as on the raw data sheets.

Other lab defined qualifiers may occur. In general, these should be addressed in the SDG narrative.

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SAMPLE DELIVERY GROUP H0377

SDG 7111
Contact L.A. Johnson

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Contract TRB-SBB-207925
Case no SDG-H0377

WORK SUMMARY

The Work Summary Report shows all samples, including QC samples, and all relevant analyses in one Sample Delivery Group (SDG). This report is often useful as supporting documentation for an invoice.

The following notes apply to this report:

- * TEST is a code for the method used to measure associated analytes. Results and related information for each analyte are on the Data Sheet Report. In special cases, a test code used in the summary data section is not the same as in associated raw data. In this case, both codes are shown on the Work Summary.
- * SUFFIX is the lab's code to distinguish multiple analyses (recounts, reworks, reanalyses) of a fraction of the sample. The suffix indicates which result is being reported. An empty suffix normally identifies the first attempt to analyze the sample.
- * The LAB SAMPLE ID, TEST and SUFFIX uniquely identify all supporting data for a result. The Method Summary Report for each TEST has method performance data, such as yield, for each lab sample id and suffix and procedures used in the method.
- * PLANCHET is an alternate lab identifier for work done for one test. It, combined with the TEST and SUFFIX, may be the best link to raw data.
- * For QC samples, only analyses that directly QC some regular sample are shown. The Lab Control Sample, Method Blank, Duplicate, Matrix Spike and Method Summary Reports detail these relationships.
- * The SAS (Special Analytical Services) Number is a client or lab assigned code that reflects special processing for samples, such as rapid turn around. Counts of tests done are lists by SAS number since it is likely to affect prices.

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SDG 7111
Contact L.A. Johnson

REPORT GUIDE

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0377

DATA SHEET

The Data Sheet Report shows all results and primary supporting information for one client sample or Method Blank. This report corresponds to both the CLP Inorganics and Organics Data Sheet.

The following notes apply to this report:

- * TEST is a code for the method used to measure an analyte. If the TEST is empty, no data is available; the analyte was not analyzed for.
- * The LAB SAMPLE ID and TEST uniquely identify work within the Summary Data Section of a Data Package. The Work Summary and Method Summary Reports further identify raw data that underlies this work.

The Method Summary Report for each TEST has method performance data, such as yield, for each Lab Sample ID and a list of procedures used in the method.

- * ERRORS can be labeled TOTAL or COUNT. TOTAL implies a preparation (non-counting method) error has been added, as square root of sum of squares, to the counting error denoted by COUNT. The preparation errors, which may vary by preparation batch, are shown on the Method Summary Report.
- * A RESULT can be 'N.R.' (Not Reported). This means the lab did this work but chooses not to report it now, possibly because it was reported at another time.
- * When reporting a Method Blank, a RESULT can be 'N.A.' (Not Applicable). This means there is no reported client sample work in the same preparation batch as the Blank's result. This is likely to occur when the Method Blank is associated with reanalyses of selected work for a few samples in the SDG.

The following qualifiers are defined by the DVD system:

U The RESULT is less than the MDA (Minimum Detectable Activity).

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GUIDE, cont.

Client Hanford
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Case no SDG-H0377

DATA SHEET

If the MDA is blank, the ERROR is used as the limit.

- J The RESULT is less than the RDL (Required Detection Limit) and no U qualifier is assigned.
- B A Method Blank associated with this sample had a result without a U flag and, after correcting for possibly different aliquots, that result is greater than or equal to the MDA for this sample.
- Normally, B is not assigned if U is. When method blank subtraction is shown on this report, B flags are assigned based on the unsubtracted values while U's are assigned based on the subtracted ones. Both flags can be assigned in this case.
- For each sample result, all Method Blank results in the same preparation batch are compared. The Method Summary Report documents this and other QC relationships.
- L Some Lab Control Sample that QC's this sample had a low recovery. The lab can disable assignment of this qualifier.
- H Similar to 'L' except the recovery was high.
- P The RESULT is 'preliminary'.
- X Some data necessary to compute the RESULT, ERROR or MDA was manually entered or modified.
- 2 There were two or more results available for this analyte. The reported result may not be the same as in the raw data.

Other qualifiers are lab defined. Definitions should be in the SDG narrative.

The following values are underlined to indicate possible problems:

- * An MDA is underlined if it is bigger than its RDL.

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GUIDE, cont.

Client Hanford
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Case no SDG-H0377

DATA SHEET

- * An ERROR is underlined if the 1.645 sigma counting error is bigger than both the MDA and the RESULT, implying that the MDA may not be a good estimate of the 'real' minimum detectable activity.
- * A negative RESULT is underlined if it is less than the negative of its 2 sigma counting ERROR.
- * When reporting a Method Blank, a RESULT is underlined if greater than its MDA. If the MDA is blank, the 2 sigma counting error is used in the comparison.

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REPORT GUIDE

Client Hanford
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LAB CONTROL SAMPLE

The Lab Control Sample Report shows all results, recoveries and primary supporting information for one Lab Control Sample.

The following notes apply to this report:

- * All fields in common with the Data Sheet Report have similar usage. Refer to its Report Guide for details.
- * An amount ADDED is the lab's value for the actual amount spiked into this sample with its ERROR an estimate of the error of this amount.

An amount added is underlined if its ratio to the corresponding RDL is outside protocol specified limits.

- * REC (Recovery) is RESULT divided by ADDED expressed as a percent.
- * The first, computed limits for the recovery reflect:
 1. The error of RESULT, including that introduced by rounding the result prior to printing.

If the limits are labeled (TOTAL), they include preparation error in the result. If labeled (COUNT), they do not.
 2. The error of ADDED.
 3. A lab specified, per analyte bias. The bias changes the center of the computed limits.
- * The second limits are protocol defined upper and lower QC limits for the recovery.
- * The recovery is underlined if it is outside either of these ranges.

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DUPLICATE

The Duplicate Report shows all results, differences and primary supporting information for one Duplicate and associated Original sample.

The following notes apply to this report:

- * All fields in common with the Data Sheet Report have similar usage. This applies both to the Duplicate and Original sample data. Refer to the Data Sheet Report Guide for details.

If the Duplicate has data for a TEST and the lab did not do this test to the Original, the Original's RESULTS are underlined.

- * The RPD (Relative Percent Difference) is the absolute value of the difference of the RESULTS divided by their average expressed as a percent.

If both RESULTS are less than their MDAs, no RPD is computed and a '-' is printed.

For an analyte, if the lab did work for both samples but has data for only one, the MDA from the sample with data is used as the other's result in the RPD.

- * The first, computed limit is the sum, as square root of sum of squares, of the errors of the results divided by the average result as a percent, hence the relative error of the difference rather than the error of the relative difference. The errors include those introduced by rounding the RESULTS prior to printing.

If this limit is labeled TOT, it includes the preparation error in the RESULTS. If labeled CNT, it does not.

This value reported for this limit is at most 999.

- * The second limit for the RPD is the larger of:

1. A fixed percentage specified in the protocol.

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Contact L.A. Johnson

GUIDE, cont.

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0377

DUPLICATE

2. A protocol factor (typically 2) times the average MDA as a percent of the average result. This limit applies when the results are close to the MDAs.

- * The RPD is underlined if it is greater than either limit.
- * If specified by the lab, the second limit column is replaced by the Difference Error Ratio (DER), which is the absolute value of the difference of the results divided by the quadratic sum of their one sigma errors, the same errors as used in the first limit.

Except for differences due to rounding, the DER is the same as the RPD divided by the first RPD limit with the limit scaled to 1 sigma.

- * The DER is underlined if it is greater than the sigma factor, typically 2 or 3, shown in the header for the first RPD limit.

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SDG 7111
Contact L.A. Johnson

REPORT GUIDE

Client Hanford
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Case no SDG-H0377

MATRIX SPIKE

The Matrix Spike Report shows all results, recoveries and primary supporting information for one Matrix Spike and associated Original sample.

The following notes apply to this report:

- * All fields in common with the Data Sheet Report have similar usage. This applies both to the Spiked and Original sample data. Refer to the Data Sheet Report Guide for details.

If the Spike has data for a TEST and the lab did not do this test to the Original, the Original's RESULTS are underlined.

- * An amount ADDED is the lab's value for the actual amount spiked into the Spike sample with its ERROR an estimate of the error of this amount.

An amount is underlined if its ratio to the corresponding RDL is outside protocol specified limits.

- * REC (Recovery) is the Spike RESULT minus the Original RESULT divided by ADDED expressed as a percent.

- * The first, computed limits for the recovery reflect:

1. The errors of the two RESULTS, including those introduced by rounding them prior to printing.

If the limits are labeled (TOTAL), they include preparation error in the result. If labeled (COUNT), they do not.

2. The error of ADDED.

3. A lab specified, per analyte bias. The bias changes the center of the computed limits.

- * The second limits are protocol defined upper and lower QC limits

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Report date 05/10/99

TMA / RICHMOND
SAMPLE DELIVERY GROUP H0377

SDG 7111
Contact L.A. Johnson

GUIDE, cont.

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0377

MATRIX SPIKE

for the recovery.

These limits are left blank if the Original RESULT is more than a protocol defined factor (typically 4) times ADDED. This is a way of accounting for that when the spike is small compared to the amount in the original sample, the recovery is unreliable.

- * The recovery is underlined (out of spec) if it is outside either of these ranges.

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SUMMARY DATA SECTION

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Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 05/10/99

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SAMPLE DELIVERY GROUP H0377

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REPORT GUIDE

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0377

METHOD SUMMARY

The Method Summary Report has two tables. One shows up to five results measured using one method. The other has performance data for the method. There is one report for each TEST, as used on the Data Sheet Report.

The following notes apply to this report:

- * Each table is subdivided into sections, one for each preparation batch. A preparation batch is a group of aliquots prepared at roughly the same time in one work area of the lab using the same method.

There should be Lab Control Sample and Method Blank results in each preparation batch since this close correspondence makes the QC meaningful. Depending on lab policy, Duplicates need not occur in each batch since they QC sample dependencies such as matrix effects.

- * The RAW TEST column shows the test code used in the raw data to identify a particular analysis if it is different than the test code in the header of the report. This occurs in special cases due to method specific details about how the lab labels work.

The Lab Sample or Planchet ID combined with the (Raw) Test Code and Suffix uniquely identify the raw data for each analysis.

- * If a result is less than both its MDA and RDL, it is replaced by just 'U' on this report. If it is greater than or equal to the RDL but less than the MDA, the result is shown with a 'U' flag.

The J and X flags are as on the data sheet.

- * Non-U results for Method Blanks are underlined to indicate possible contamination of other samples in the preparation batch. The Method Blank Report has supporting data.
- * Lab Control Sample and Matrix Spike results are shown as: ok, No data, LOW or HIGH, with the last two underlined. 'No data'

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GUIDE, cont.

Client Hanford
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METHOD SUMMARY

means no amount ADDED was specified. 'LOW' and 'HIGH' correspond to when the recovery is underlined on the Lab Control Sample or Matrix Spike Report. See these reports for supporting data.

- * Duplicate sample results are shown as: ok, No data, or OUT, with the last two underlined. 'No data' means there was no original sample data found for this duplicate. 'OUT' corresponds to when the RPD is underlined on the Duplicate Report. See this report for supporting data.
- * If the MDA column is labeled 'MAX MDA', there was more than one result measured by the reported method and the MDA shown is the largest MDA. If not all these results have the same RDL, the MAX MDA reflects only those results with RDL equal to the smallest one.

MDAs are underlined if greater than the printed RDL.

- * Aliquots are underlined if less than the nominal value specified for the method.
- * Preparation factors are underlined if greater than the nominal value specified for the method.
- * Dilution factors are underlined if greater than the nominal value specified for the method.
- * Residues are underlined if outside the range specified for the method. Residues are not printed if yields are.
- * Yields, which may be gravimetric, radiometric or some type of recovery depending on the method, are underlined if outside the range specified for the method.
- * Efficiencies are underlined if outside the range specified for the method. Efficiencies are detector and geometry dependent so this test is only approximate.

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METHOD SUMMARY

- * Count times are underlined if less than the nominal value specified for the method.
- * Resolutions (as FWHM; Full Width at Half Max) are underlined if greater than the method specified limit.
- * Tracer drifts are underlined if their absolute values are greater than the method specified limit. Tracer drifts are not printed if percent moistures are.
- * Days Held are underlined if greater than the holding time specified in the protocol.
- * Analysis dates are underlined if before their planchet's preparation date or, if a limit is specified, too far after it.

For some methods, ratios as percentages and error estimates for them are computed for pairs of results. A ratio column header like '1+3' means the ratio of the first result column and the third result column.

Ratios are not computed for Lab Control Sample, Method Blank or Matrix Spike results since their matrices are not necessarily similar to client samples'.

The error estimate for a ratio of results from one planchet reflects only counting errors since other errors should be correlated. For a ratio involving different planchets, if QC limits are computed based on total errors, the error for the ratio allows for the preparation errors for the planchets.

The ratio is underlined (out of spec) if the absolute value of its difference from the nominal value is greater than its error estimate. If no nominal value is specified, this test is not done.

For Gross Alpha or Gross Beta results, there may be a column showing the sum of other Alpha or Beta emitters. This sum includes all relevant

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GUIDE, cont.

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0377

METHOD SUMMARY

results in the DVD database, whether reported or not. Results in the sum are weighted by a particles/decay value specified by the lab for each relevant analyte. Results less than their MDA are not included. No sums are computed for Lab Control, Method Blank or Matrix Spike samples since their various planchets may not be physically related.

If a ratio of total isotopic to Gross Alpha or Beta is shown, the error for the ratio reflects both the error in the Gross result and the sum, as square root of sum of squares, of the errors in the isotopic results.

For total elemental uranium or thorium results, there may be a column showing the total weight computed from associated isotopic results. Ignoring results less than their MDAs, this is a weighted sum of the isotopic results. The weights depend on the molecular weight and half-life of each isotope so as to convert activities (decays) to weight (atoms).

If a ratio of total computed to measured elemental uranium or thorium is shown, the error for the ratio reflects the errors in all the measurements.

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SUMMARY DATA SECTION

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Lab id TMANC
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CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST				B99-002-79		Page 1 of 1	
Collector Fahlberg/Coffman		Company Contact R Coffman		Telephone No. 373-6425		Project Coordinator TRENT, SJ	
Project Designation 100 BC Areas - Full Protocol		Sampling Location 100 B/C 116-B-12 deep zone		SAF No. B99-002		Price Code Data Turnaround 15 Days	
Ice Chest No. SML-463		Field Logbook No. EL 1327-2		Method of Shipment Fed Ex			
Shipped To TMA/REGRA R.F. 4-1-99		Offsite Property No. A990097		Bill of Lading/Air Bill No. 423579524364			
				COA			

POSSIBLE SAMPLE HAZARDS/REMARKS Special Handling and/or Storage	Preservation	None	None	Cool 4C	None	None					
	Type of Container	aG	aG	aG	aG	aG					
	No. of Container(s)	1	1	1	1	1					
	Volume	60mL	60mL	125mL	250mL	1000mL					

SAMPLE ANALYSIS				Activity Scan	See item (1) in Special Instructions.	Chromium Hex - 7196	ICP Metals - 6010A (SW- 846) (Chromium, Lead); Mercury - 7471 - (CV)	See item (2) in Special Instructions.				
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Sample No.	Matrix *	Sample Date	Sample Time									
✓ B0V1W7	Soil	4-1-99	0845	X	X				X			tie to BotVY9
✓ B0V1W8	Soil	4-1-99	0920	X	X				X			Botwo
✓ B0V1W9	Soil	4-1-99	0920	X	X				X			Botwo
✓ B0V1X0	Soil	4-1-99	0945	X	X				X			Botwo

CHAIN OF POSSESSION	Sign/Print Names		SPECIAL INSTRUCTIONS				Matrix *	
Relinquished By	Date/Time	Received By	Date/Time	(1) Americium-241; Isotopic Plutonium; Isotopic Uranium; Strontium-89,90 -- Total Sr; Nickel-63 (2) Gamma Spectroscopy (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155); Gamma Spec - Add-on (Americium-241, Uranium-238) R.T. Coffman unavailable to relinquish samples.				Soil Water Vapor Other Solid Other Liquid
Relinquished By RTCOFFMAN RTCoffman	4-1-99 1600	Received By Ref. IC	4-1-99 1600					
Relinquished By Ref. IC	4/6/99 1110	Received By Rene Nelson / R. Nielson	4/6/99 1110					
Relinquished By Rene Nelson / R. Nielson	4/6/99 1300	Received By Fed Ex	4-6-99 10:20					
Relinquished By Fed Ex	4-7-99 10:30	Received By Rene Nelson / R. Nielson	4-7-99 10:30					

LABORATORY SECTION	Received By	Title	Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

Contractor BHI - Hanford	OFF-SITE PROPERTY CONTROL	CONTROL NO. (To be obtained from PROPERTY MANAGEMENT) A990097
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PART I - TO BE COMPLETED BY ORIGINATOR

Department ERC Engineering support	Section Field & Analytical support	Unit Field Sampling
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The following items are to be shipped from	<input checked="" type="checkbox"/> Contractor	<input type="checkbox"/> Vendor
--------------------------------------------	------------------------------------------------	---------------------------------

Routing	<input checked="" type="checkbox"/> Prepaid	<input type="checkbox"/> Collect
---------	---------------------------------------------	----------------------------------

Shipped to Company Address City Country	Thermo Retec 2030 Wright Ave Richmond, CA 94804-0040 (510)235-2633 Attn: Larry Johnson	Off-site Custodian	Payroll No.
	State Zip Code	On-site Custodian	

Qty.	Property No.	Description (include Manufacture Name, Model, Serial No.)	Acquisition Cost
1	38 lbs.	Sample #: BOVIW7, BOVIW8, BOVIW9, BOVIXO, BOVIIS, BOVIIB Cooler ID: SML-463 Polycooler with environmental samples packed in packing peanuts. BILL OF LADING # 4235 7952 4364	N/A

<input type="checkbox"/> Classified	<input checked="" type="checkbox"/> Unclassified	<input type="checkbox"/> Shipped Under DOE Contract	<input type="checkbox"/> Shipped Under Contractor's Use Permit Contract
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Necessity for the off-site use of this property

☐ Required for Project Work. List Project No. _____

☐ Business Trip

☐ Off-site Assignment

☐ Shipment to Subcontractor. List Subcontract No. _____

☐ Other (Please specify) _____

CERTIFICATION OF THE RADIATION MONITORING RELEASE MUST BE SECURED THE SAME DAY THAT MATERIAL IS DELIVERED TO SHIPPING.

RM Clearance for Public Release	RM Survey No. N/A RN 4/6/99	Date
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Location of and Contact for Property (Name/Phone No./Bldg./Area)

Renee Nielson/(509)372-9604/3728 Bldg/300 Area

Date Ready for Shipment 4/6/99	Cost Code to be Charged R16B6A2600	Approximate Date This Property will be Returned
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Originated By Renee Nielson	Date 4/6/99	Authorized By Renee Nielson	Date 4/6/99
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Property Representative Signature R. Christensen	Date 4/6/99	Property Management Approval R. Christensen	Date 4/6/99
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PART II - TO BE COMPLETED BY SHIPPING

Authorized Shipping Signature C.R. Nelson	Date 4-6-99
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DISTRIBUTION (AFTER FINAL SIGNATURES)

White - Property Management	Yellow - Shipping	Green - Accounts Payable	Pink - Originator	Goldenrod - Property Management
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Thermo NUtech - Richmond

SAMPLE RECEIPT CHECKLIST

SAMPLE RECEIPT			
Client: <u>Beshitel Hanford</u>	Date/Time received <u>4-7-99 10:30</u>		
CoC No. <u>B99-001-123, B99-002-79</u>			
Container I.D. No. <u>SML-463</u>	Requested TAT (Days) <u>7-15</u>	P.O. Received Yes [] No []	
INSPECTION			
1. Custody seals on shipping container intact?	Yes [✓]	No []	N/A []
2. Custody seals on shipping container dated & signed?	Yes [✓]	No []	N/A []
3. Custody seals on sample containers intact?	Yes [✓]	No []	N/A []
4. Custody seals on sample containers dated & signed?	Yes [✓]	No []	N/A []
5. Cooler Temperature: _____	Packing material is:		Wet [] Dry [✓]
6. Number of samples in shipping container:	<u>6</u>		
7. Number of containers per sample: _____	(Or see CoC <u>✓</u>)		
8. Paperwork agrees with samples?	Yes [✓]	No []	
9. Samples have: Tape [✓] Hazard labels [] Rad labels [✓] Appropriate sample labels [✓]			
10. Samples are: In good condition [✓] Leaking [] Broken Container [] Missing []			
11. Describe any anomalies: _____	_____		

13. Was P.M. notified of any anomalies? Yes [✓] No []	Date <u>4-7-99</u>		
14. Received by <u>J.P. Carr</u>	Date: <u>4-7-99</u>	Time: <u>10:30</u>	
LOGIN			
TNU W.O. No. _____	Group No. _____	Client W.O. No. _____	
PROGRAM MANAGER			
Sample holding times exceeded?	Yes []	No []	
Client Notified: Name _____	Date/time _____		